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INDICATOR SPECIES FOR THE FOREST HABITAT TYPES OF MONTANA

DIVISION OF TIMBER MANAGEMENT, REGION ONE

AND

INTERMOUNTAIN FOREST AND RANGE EXPERIMENT STATION

June 1974

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INTRODUCTION

This training manual was prepared to aid foresters in Region One to identify key indicator species for Montana forest habitat types.

The species illustrated are to be used in conjunction with:

FOREST HABITAT TYPES OF MONTANA
by
Robert D. Pfister, Bernard L. Kovalchik, Stephen F. Arno, and Richard C. Presby

A review draft of a proposed Intermountain Forest and Range Experiment Station Research Paper to be published in 1975. This draft combines and replaces

Preliminary Forest Habitat Types of Western Montana, May 1972

and

Preliminary Forest Habitat Types of Central and Eastern Montana, May 1973

May 1974

Intermountain Forest and Range Experiment Station
and Northern Region, U.S.F.S., Missoula, Montana.

The species illustrations were copied, by permission of the University of Washington Press, from:

Hitchcock, C. Leo et al. 1955-1969
Vascular Plants of the Pacific Northwest:
Five volumes, University of Washington Press,
Seattle and London, illus.
Drawings by Jeanne R. Janish.

One caution in using this aid for species identification is that many similar species are not described. The user needs to become very familiar with all the characteristics of the indicator species to avoid the mistake of listing an indicator species as present when that species is absent and a related species is present. Use of a complete taxonomic reference will increase your proficiency in distinguishing related species. The most current complete reference is:

Hitchcock, C. Leo and Arthur Cronquist 1973
Flora of the Pacific Northwest:
University of Washington Press, Seattle and London,
730 pp., illus.

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MONTANA HABITAT TYPE FIELD FORM | NAME | DATE

(CODE DESCRIPTION)

TOPOGRAPHY: 1-Ridge, 2-Upper slope, 3-Mid slope, 4-Lower slope, 5-Bench or flat, 6-Streambottom

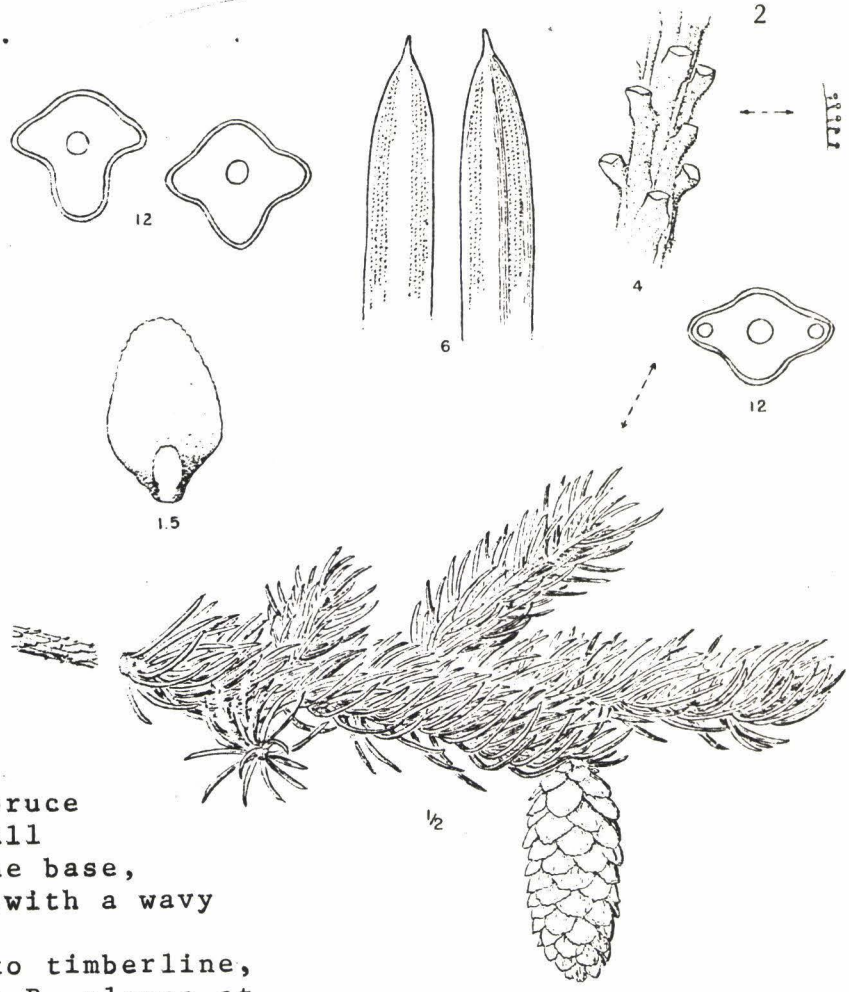
HORIZONTAL CONFIGURATION: 1-Convex (dry), 2-Straight, 3-Concave (wet), 4-Undulating

VEGETATION COVERAGE: CLASS (1%): 0-None, T-Rare to 1%, 1-1 to 5, 2-5 to 25, 3-25 to 50, 4-50 to 75, 5-75 to 95, 6-95 to 100

NOTE: Rate trees (> 4") and regen (0-4") separately (e.g., 4/2)

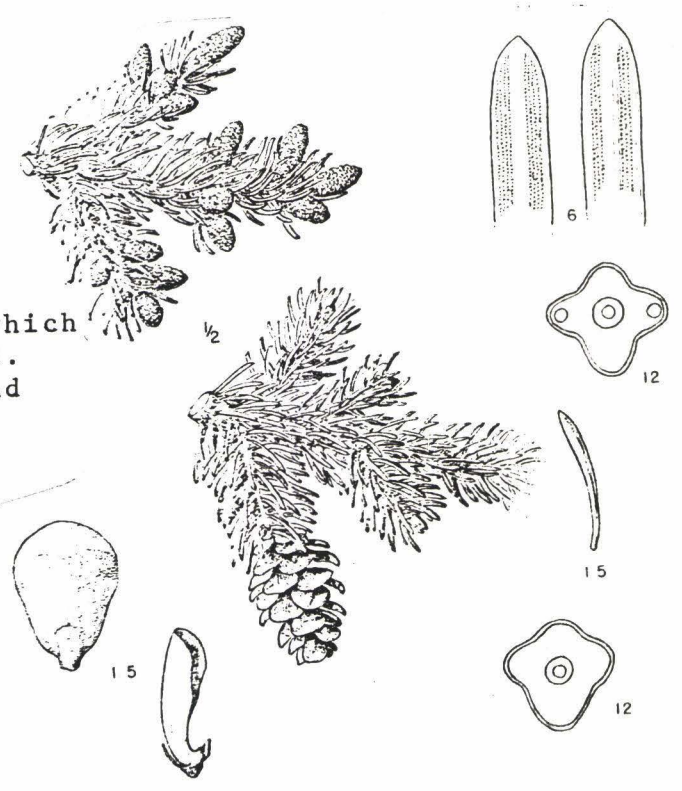
			Plot No.			
			Location T, R, S			
			Elevation			
			Aspect			
			Slope	%	%	%
			Topography			
			Configuration			
	TREES Scientific Name	Abbrev	Common Name			
	1. Abies grandis	GF	Grand fir	/	/	/
	2. Abies lasiocarpa	AF	Subalpine fir	/	/	/
	3. Larix lyallii	AL	Alpine larch	/	/	/
	4. Larix occidentalis	WL	Western larch	/	/	/
2	5. Picea engelmannii	ES	Engelmann spruce	/	/	/
2	6. Picea glauca	WS	White spruce	/	/	/
3	7. Pinus albicaulis	WBP	Whitebark pine	/	/	/
3	8. Pinus contorta	LPP	Lodgepole pine	/	/	/
	9. Pinus flexilis	PF	Limber pine	/	/	/
	10. Pinus monticola	WP	Western white pine	/	/	/
	11. Pinus ponderosa	PP	Ponderosa pine	/	/	/
	12. Pseudotsuga menziesii	DF	Douglas-fir	/	/	/
	13. Thuja plicata	WRC	Western red cedar	/	/	/
	14. Tsuga heterophylla	WH	Western hemlock	/	/	/
	15. Tsuga mertensiana	MH	Mountain hemlock	/	/	/
	SHRUBS					
4	1. Alnus sinuata	Alsi	Mountain alder			
4	2. Arctostaphylos uva-ursi	Aruv	Kinnikinnick			
5	3. Berberis repens	Bere	Creeping Oregon grape			
5	4. Cornus canadensis	Coca	Bunchberry dogwood			
6	5. Holodiscus discolor	Hodi	Ocean spray			
6	6. Juniperus communis (+ horizontalis)	Juco	Common (+ creeping) juniper			
7	7. Ledum glandulosum	Legl	Laborador tea			
7	8. Linnaea borealis	Libo	Twin flower			
7	9. Menziesia ferruginea	Mefe	Menziesia			
8	10. Oplopanax horridum	Opho	Devil's club			
8	11. Physocarpus malvaceus	Phma	Ninebark			
8	12. Prunus virginiana	Prvi	Chokecherry			
9	13. Purshia tridentata	Putr	Bitterbrush			
9	14. Ribes montigenum	Rimo	Mountain gooseberry			
9	15. Shepherdia canadensis	Shca	Buffalo-berry			
10	16. Spiraea betulifolia	Apbe	White spirea			
10	17. Symphoricarpos albus	Syal	Snowberry			
11	18. Vaccinium caespitosum	Vaca	Dwarf huckleberry			
11	19. Vaccinium globulare (membranaceum)	Vagl	Blue huckleberry			
12	20. Vaccinium scoparium (+ myrtillus)	Vasc	Grouse whortelberry			
	PERENNIAL GRAMINOIDS					
13	1. Agropyron spicatum	Agsp	Bluebunch wheatgrass			
14	2. Andropogon spp.	ANDR	Bluestem			
15	3. Calamagrostis canadensis	Caca	Bluejoint			
15	4. Calamagrostis rubescens	Caru	Pinegrass			
16	5. Carex geyeri	Cage	Elk sedge			
16	6. Festuca idahoensis	Feid	Idaho fescue			
17	7. Festuca scabrella	Fesc	Rough fescue			
17	8. Luzula hitchcockii (glabrata)	Luhi	Wood-rush			
	PERENNIAL FORBS					
18	1. Actaea rubra	Acru	Baneberry			
19	2. Antenaria racemosa	Anra	Woods pussytoes			
19	3. Aralia nudicaulis	Arnu	Wild sarsaparilla			
19	4. Arnica cordifolia	Arco	Heartleaf arnica			
20	5. Athyrium filix-femina	Atfi	Lady fern			
20	6. Balsamorhiza sagittata	Basa	Arrowleaf balsamroot			
21	7. Clematis pseudoalpina (+ tenuiloba)	Clps	Virgin's bower			
21	8. Clintonia uniflora	Clun	Queen cup beadlily			
22	9. Equisetum arvense	Eqar	Common horsetail			
	10. Equisetum spp.	EQUI	Horsetails & scouring rush			
22	11. Galium triflorum	Gatr	Sweetscented bedstraw			
23	12. Gymnocarpium dryopteris	Gydr	Oak fern			
23	13. Senecio streptanthifolius	Sest	Cleft leaf groundsel			
24	14. Senecio triangularis	Setr	Arrowleaf groundsel			
24	15. Smilacina stellata	Smst	Starry Solomon's seal			
25	16. Streptopus amplexifolius	Stam	Twisted stalk			
26	17. Thalictrum occidentale	Thoc	Western meadowrue			
27	18. Valeriana sitchensis	Vasi	Sitka valerian			
27	19. Viola orbiculata	Vior	Round-leaved violet			
27	20. Xerophyllum tenax	Xete	Beargrass			
			SERIES			
			HABITAT TYPE			
			PHASE			

TREES



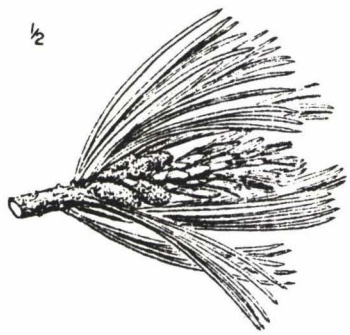
Picea engelmannii

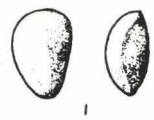
Picea engelmannii-Engelmann spruce
Habit-Tall trees to 125' tall
Cones-Scales broadest at the base, narrowing at the tip,with a wavy and papery margin.
Range-Moderate elevations to timberline, often hybridizes with P. glauca at lower elevations.



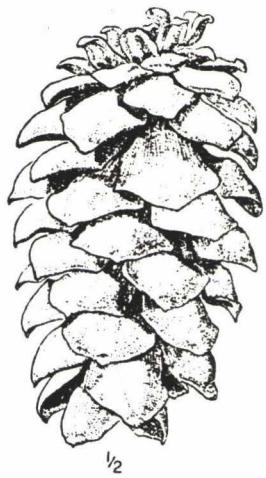
P. glauca

Picea glauca-white spruce
Habit-Tall trees to 125' tall.
Cones-Scales broadest at the tip, which is blunt, smooth, and rounded.
Range-Lower elevations in swamps and on moist mountain slopes.
Similar species-P. engelmannii



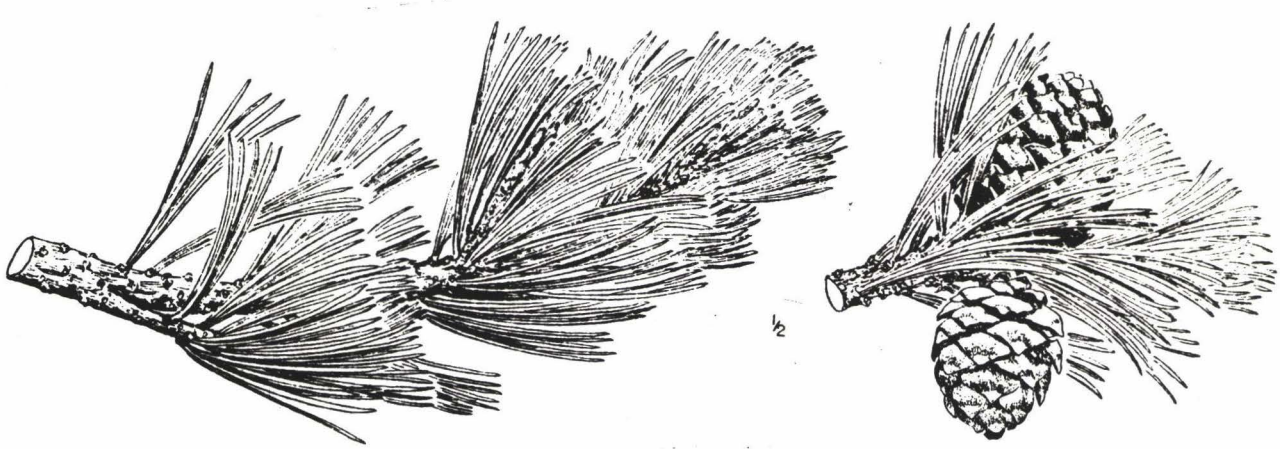


P. flexilis



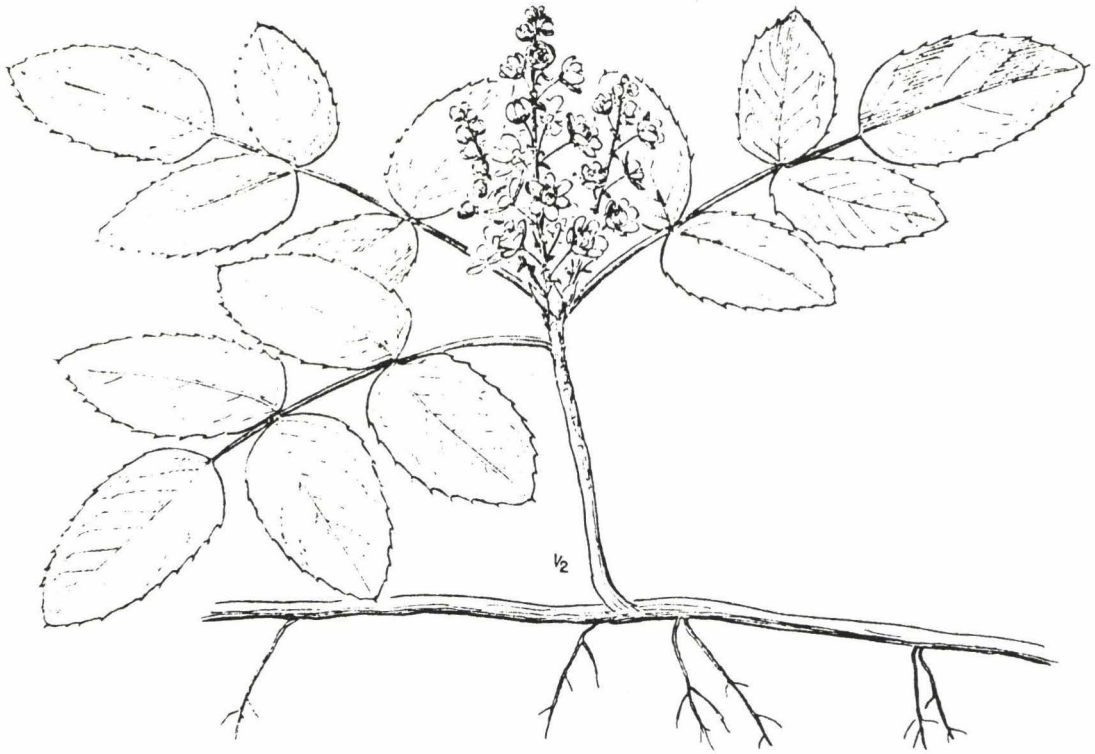
Pinus flexilis - limber pine
Range - mostly along and east of the Continental Divide.
Elevational range - common below the forest zone in the plains on rocky breaks or windswept slopes and extending on droughty sites to mid elevations; occasionally at high elevations on dry mountains.
Cones - green to light brown, 3½ - 5½" long, opening to shed seed and remaining intact on the ground for a few years.

Pinus albicaulis - whitebark pine
Range - at high elevations in west and east Montana.
Elevational range - restricted to high elevations, usually above 6500' in northwestern Montana and above 7500', or higher, in eastern Montana.
Cones - deep purple, 2 - 3½" long, disintegrating on the tree at maturity (not found on the ground except as fragments).



Pinus albicaulis

SHRUBS AND SUBSHRUBS



Berberis repens

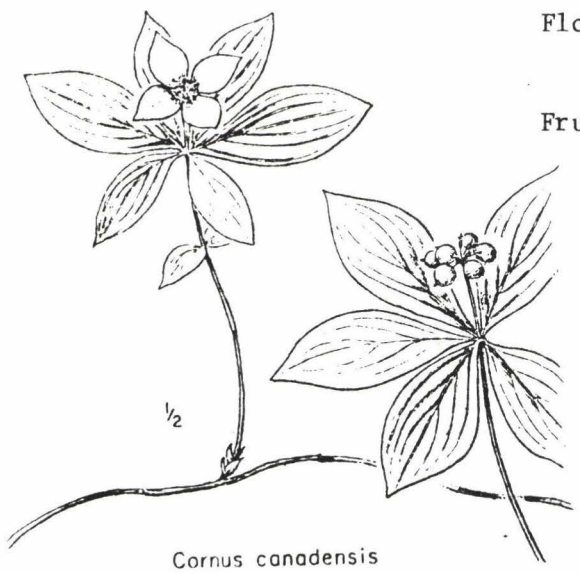
Berberis repens - Creeping Oregon grape

Habit - low, stiff-branched, rhizomatous, woody plant.

Leaflets - alternate, pinnate, 5 to 7, edged with spiny teeth.

Flowers - bright yellow in elongated clusters (racemes) blooming before new growth.

Fruit - glaucous, blue berries that resemble a bunch of grapes.



Cornus canadensis

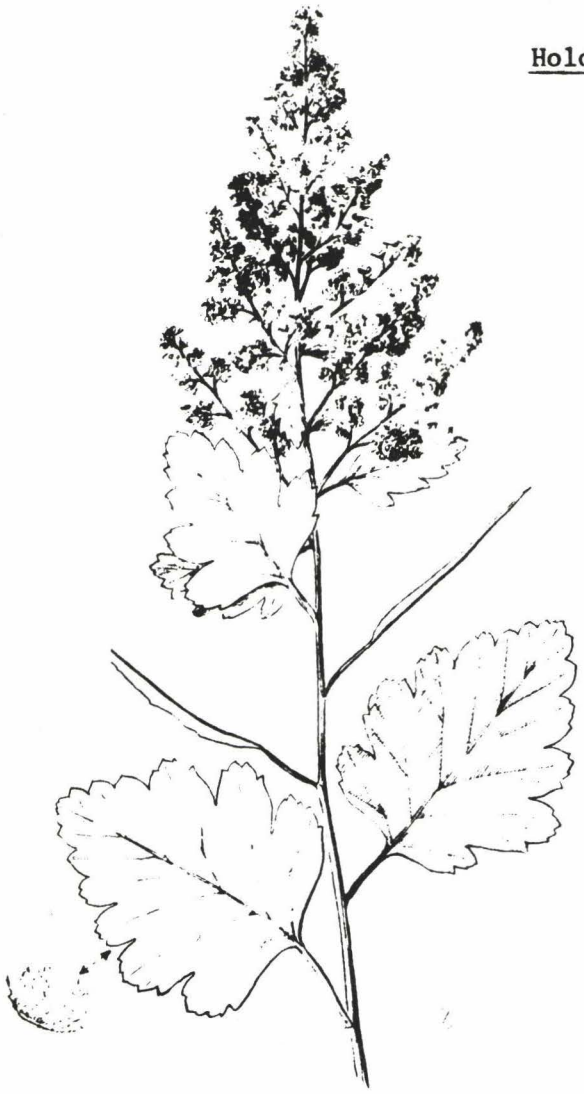
Cornus canadensis - Bunchberry dogwood

Habit - low, widely rhizomatous subshrub, 1 - 4" tall.

Leaves - 4 to 7 in terminal whorl, elliptical, nearly sessile.

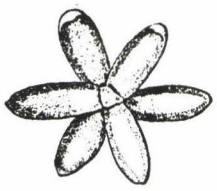
Flowers - clustered in a flower-like head with 4 petal-like bracts beneath; thus the inflorescence resembles a single, large flower.

Fruit - bright coral red, berry-like in a bunch at the top of the plant.



Holodiscus discolor

Holodiscus discolor - Oceanspray
Habit-Medium to tall shrub 3-12' tall.
Leaves-Alternate, deciduous, 1-3" long, green above, whitish below.
Flowers-Cluster of tiny cream-white flowers.
Stem-Young stems strongly ridged, older stems shreddy.
Similar species-Physocarpus malvaceus.



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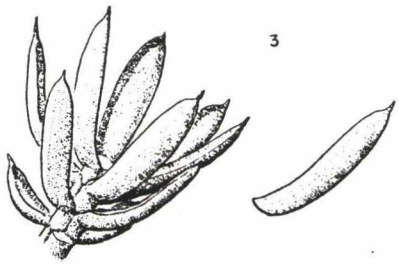

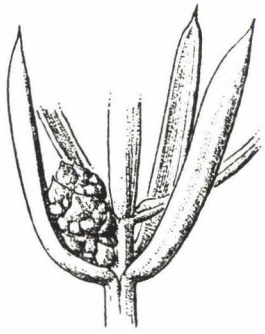

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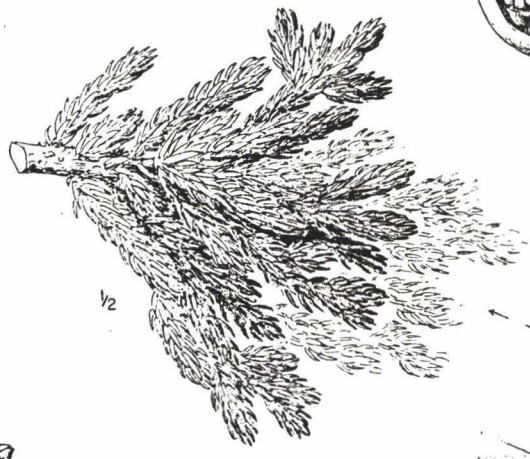

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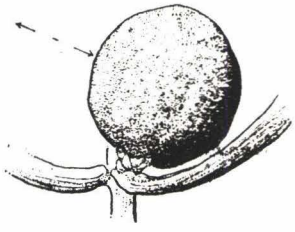
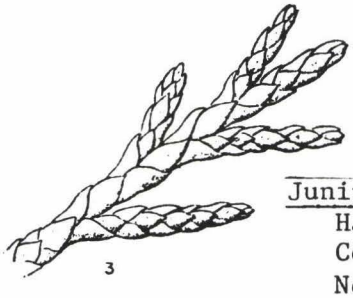


Juniperus communis



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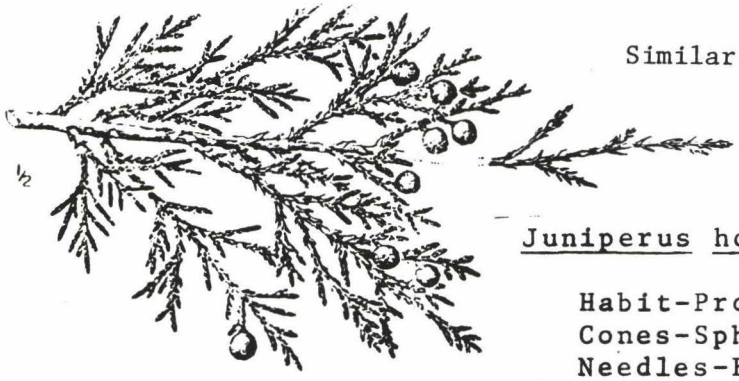
Juniperus communis - common juniper
Habit - low shrub, less than 3 feet high.
Cones - spherical, small, becoming fleshy.
Needles - borne in whorls of 3, needle-like, not glandular on dorsal surface, nearly ½" long.
Similar species - J. horizontalis.



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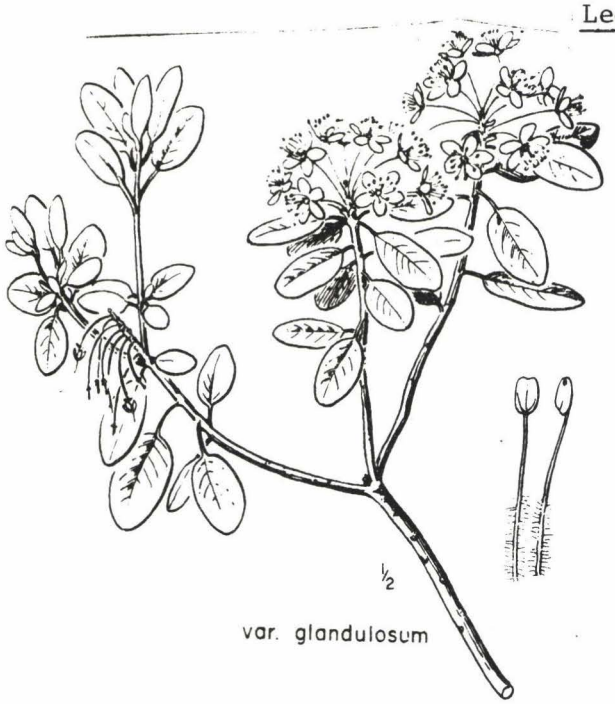
J. horizontalis

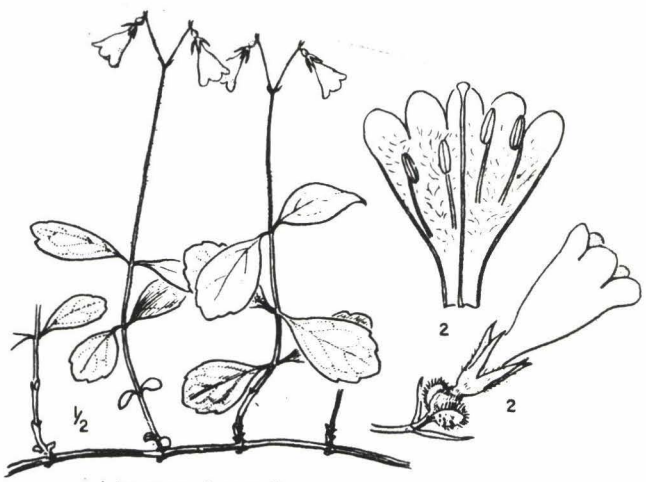
Juniperus horizontalis-creeping juniper

Habit-Prostrate shrub less than 12" high.
Cones-Spherical,small,becoming fleshy.
Needles-Borne in whorls of 2,scale-like, glandular on dorsal surface.
Similar species-J. communis



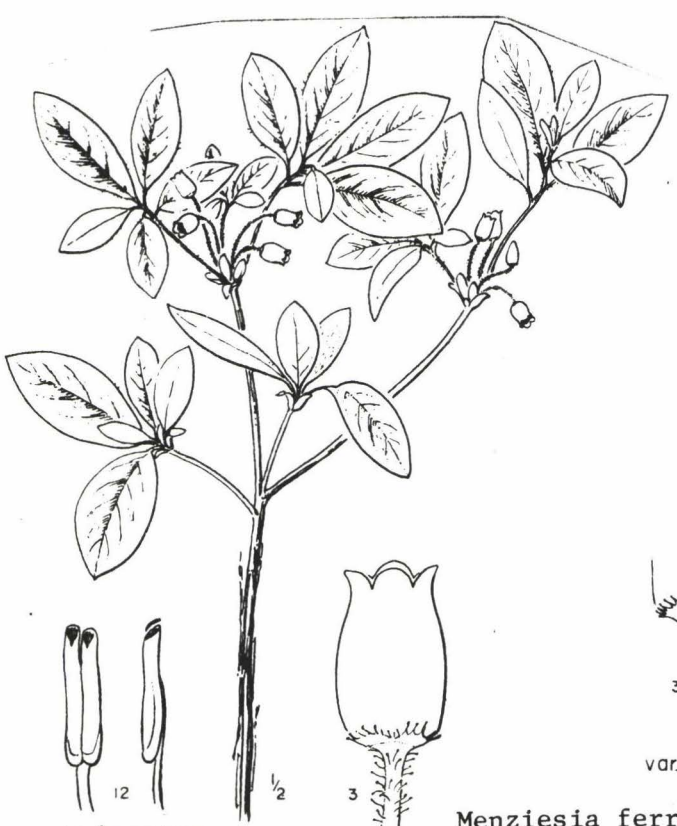
Ledum glandulosum

Ledum glandulosum - Labrador tea
Habit - low to medium shrub, 1 - 6 feet tall.
Leaves - alternate, evergreen, with yellow or black glandular dots.
Flowers - white to yellowish.
Stem - young stems finely hairy, glandular dotted.



Linnaea borealis

Linnaea borealis - twinflower
Habit - low trailing woody plant, scarcely shrublike, 2 - 5 inches tall in flower.
Leaves - opposite, evergreen, usually toothed on upper half, ½" long.
Flowers - pink to white, bell-shaped, paired (twin).
Fruit - egg shaped, dry.



Menziesia ferruginea

Menziesia ferruginea - Menziesia
Habit - medium shrub 2 to 6 feet tall.
Leaves - alternate, deciduous, 1 to 2 inches long, with small white tip or nipple, dull bluish green color.
Flowers - yellowish-red, bell-shaped.
Stem - bark shreddy to stringy.
Forage value - fair summer forage for deer and elk.

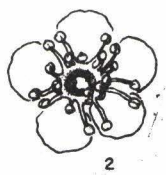
Oplopanax horridum - Devil's club
Habit-Densely spiny, medium shrub 3-9' tall, of moist places.
Leaves-Alternate, deciduous, 7-9 lobed, 4-15" broad, veins spiny.
Flowers-Small, greenish-white.
Fruit-Bright red berry, flattened, ¼-½" long.
Stem-Armed with long yellowish spines, ½-1" thick.
Similar species-Ribes spp. and Rosa spp.- spines are white, brown or red rather than yellow.

Oplopanax horridum

Physocarpus malvaceus - ninebark
Habit - low to medium shrub 2 - 6 feet tall.
Leaves - alternate, deciduous, 3 - 5 lobed, 1 - 2" broad.
Flowers - small, white in clusters.
Stem - gray, shreddy.
Similar species - Ribes spp. - often spiny, bark usually not shreddy.

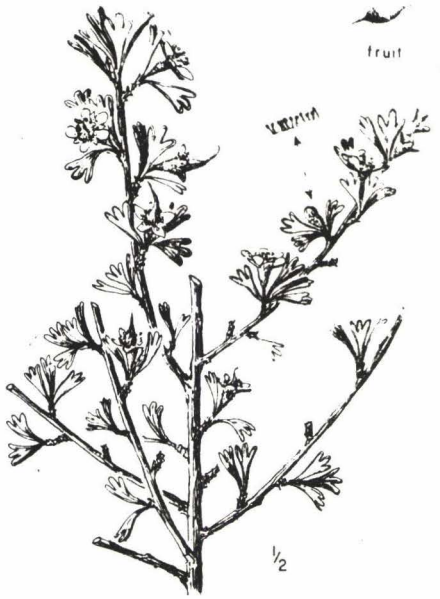
Physocarpus malvaceus

Prunus virginiana var. demissa



Prunus virginiana - chokecherry
Habit - medium shrub to small tree, 3 - 12 feet tall.
Leaves - alternate, deciduous, 2 - 3", toothed, glands, on leaf petiole.
Flowers - white in long clusters.
Fruit - fleshy, dark purplish.
Forage value - high for big game and birds.

<u>Purshia tridentata</u> - bitterbrush
Habit - medium shrub, 2 - 6 feet tall.
Leaves - alternate, deciduous to semi-deciduous, <u>3-lobed</u>.
Flowers - yellow
Stem - bark flaking off in irregular patches.
Similar species - <u>Artemisia</u> spp. - sagebrush smell.



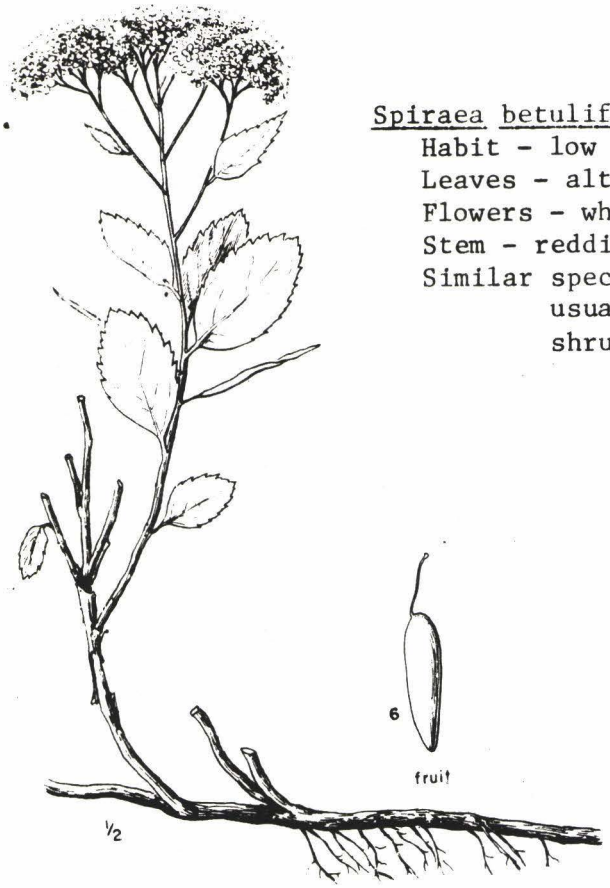
Purshia tridentata

<u>Ribes montigenum</u> - Mountain gooseberry
Habit - spiny, spreading, low shrub, of sub-alpine and alpine habitats.
Leaves - hairy and glandular, alternate, irregularly lobed, deciduous, ½ to 1 inch broad.
Flowers - 4 to 7 in clusters, whitish-pink.
Fruit - 5 to 7 mm. long, reddish berry, oblong to spherical.

R. montigenum

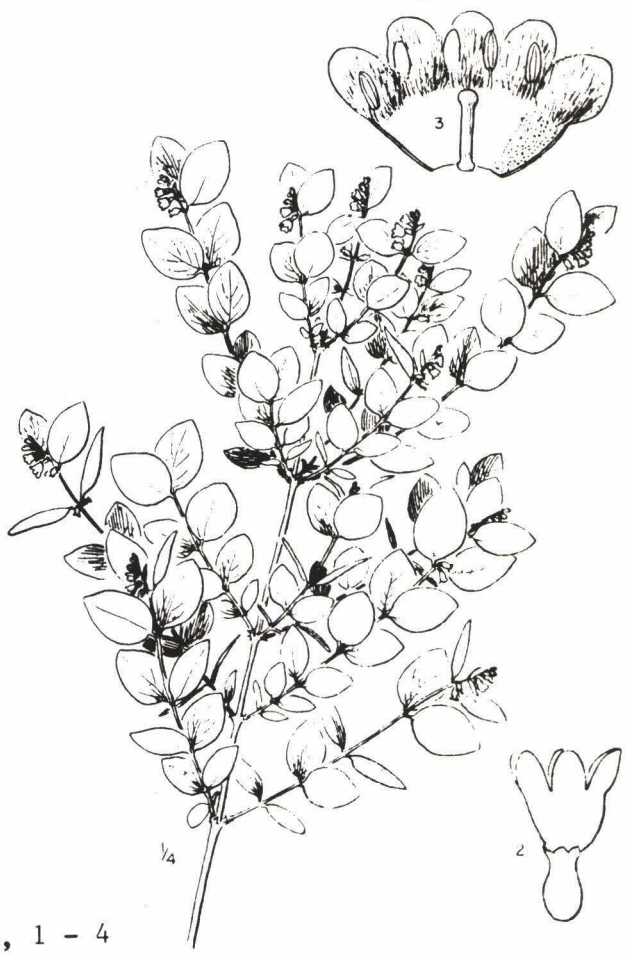
<u>Shepherdia canadensis</u> - Buffalo-berry
Habit - medium sized, deciduous, oppositely branched shrub.
Leaves - opposite; two-colored with pale undersurface covered with brown dots (scales); ovate, 2 - 3" long.
Flowers - yellow inside, brown dotted outside.
Fruit - berrylike red, containing soapy juice.

Shepherdia canadensis



Spiraea betulifolia

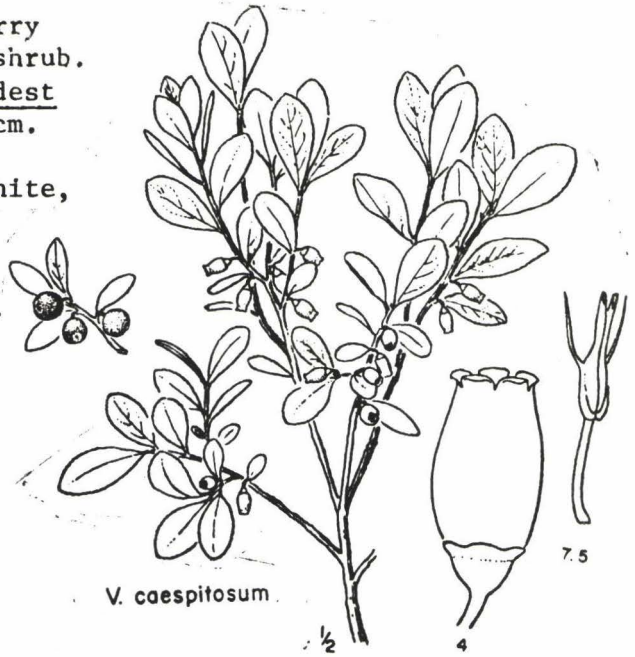
Spiraea betulifolia - white spiraea
Habit - low erect shrub, rhizomatous, 1 - 2 feet tall.
Leaves - alternate, deciduous, upper 2/3 toothed.
Flowers - white in flat topped clusters.
Stem - reddish brown.
Similar species - Amelanchier alnifolia - leaves usually toothed above the middle, tall shrub.

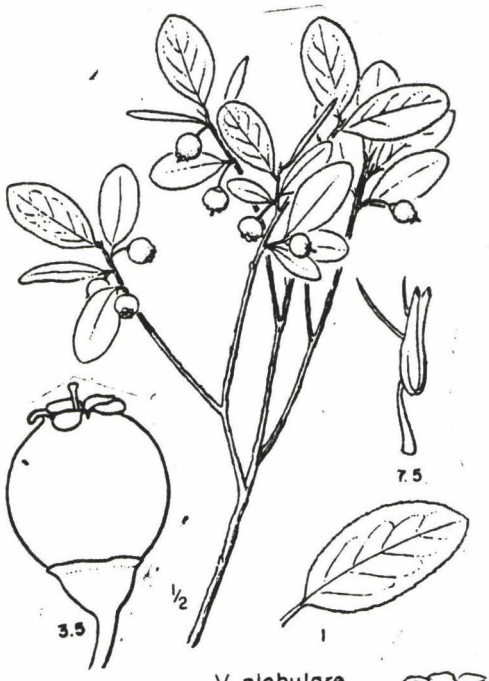


Symphoricarpos albus

Symphoricarpos albus - snowberry
Habit - low to medium shrub, rhizomatous, 1 - 4 feet tall.
Leaves - opposite, deciduous.
Flowers - white to pinkish, bell-shaped.
Fruit - berrylike, white, round.
Stem - hollow, older stems grayish and shreddy.
Similar species - Lonicera spp. - stems solid except L. ciliosa which is a vine. Fruits red to black.

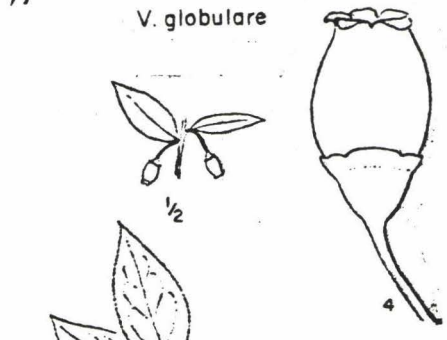
Vaccinium caespitosum - Dwarf huckleberry
Habit - dwarf to low mat-forming shrub.
Leaves - alternate, deciduous, widest above the middle, 1 - 3 cm. long.
Flowers - pale pink to greenish white, small, 5 - 6 mm.
Fruit - bluish berry, 5 - 8 mm.
Stem - rounded in cross section.

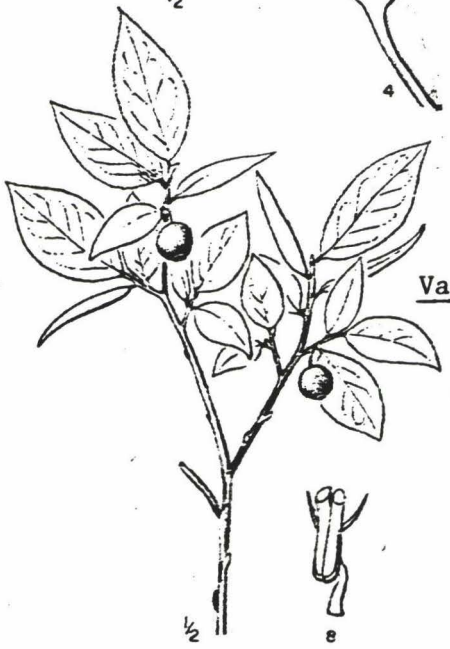




V. globulare

Vaccinium globulare - thinleaved huckleberry
Habit - low to medium shrub, 1 - 4 feet tall.
Leaves - alternate, deciduous, globular, rounded to abruptly acute at the apex.
Flowers - pinkish yellow, bell-shaped, as broad as long.
Fruit - bluish-purple berry, 6 - 8 mm. broad.
Stem - young stems angled.
Forage value - fair for deer; fruit valuable for bear and birds.
Similar species - V. membranaceum - very difficult to distinguish; leaves long, pointed, flowers longer than broad. The two are probably ecologically equivalent.





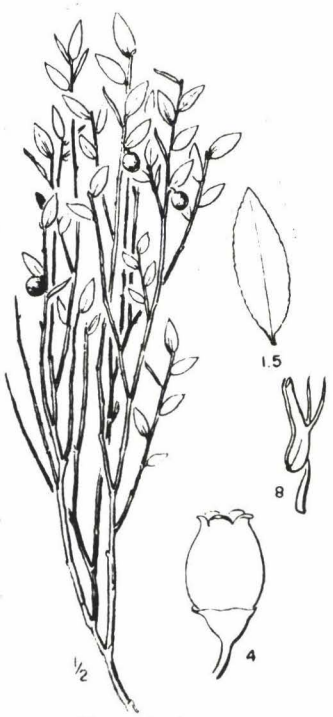
V. membranaceum

Vaccinium membranaceum - thinleaved huckleberry
Habit - spreading shrub, 1 - 6 feet tall.
Leaves - alternate, deciduous, ovate, rounded-acute at the base, pointed.
Flower - pinkish yellow, 1/3 again as long as broad.
Fruit - dark purplish-reddish berry, 7 - 9 mm. broad.
Stem - young stems angled.

Vaccinium myrtillus

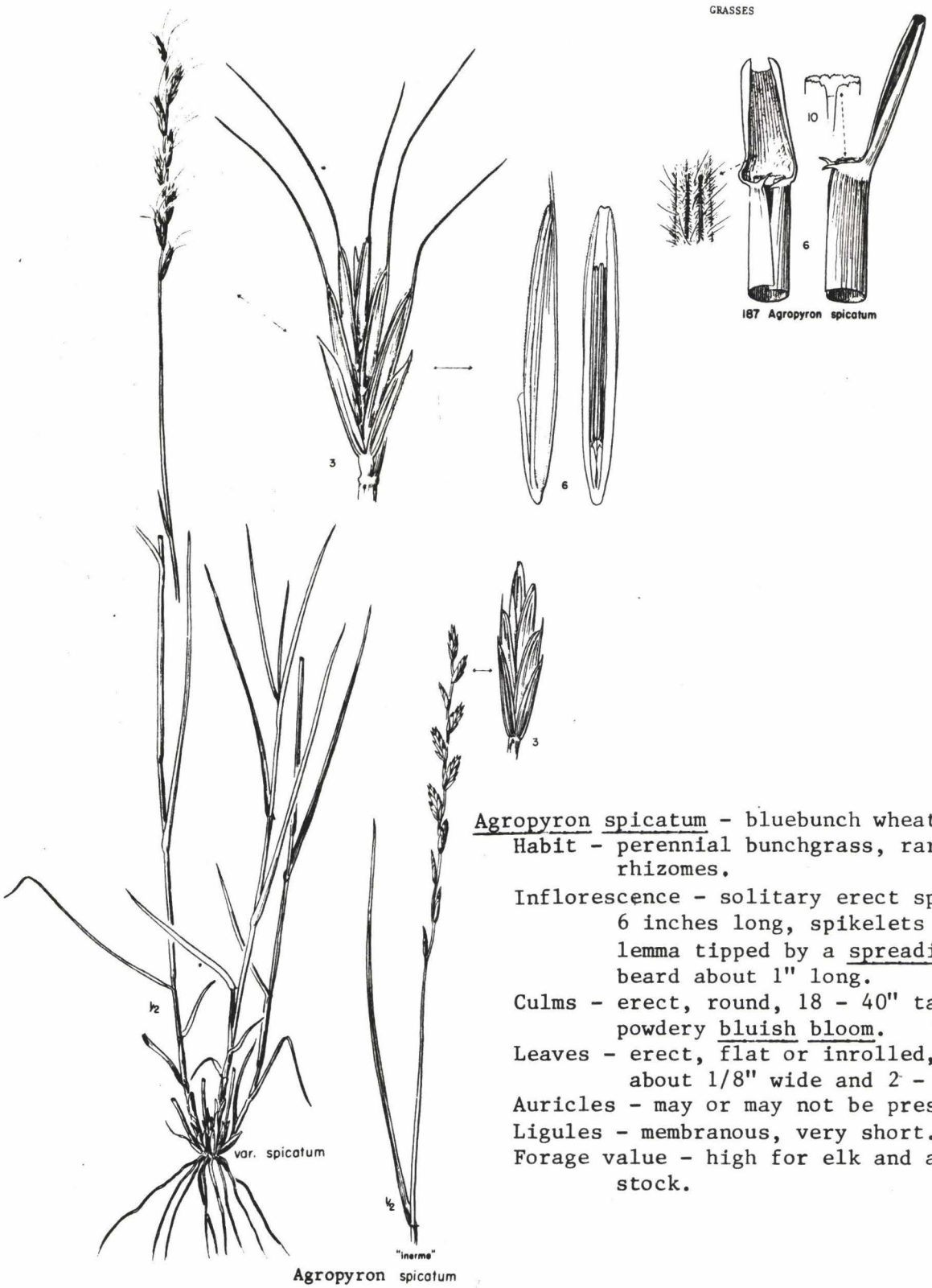
Vaccinium myrtillus - myrtle whortleberry
Habit-Low shrub, 10-15" tall.
Leaves-Alternate, deciduous, ovate, sharp-toothed, ½-1" long.
Flowers-Pinkish, global-shaped.
Fruit-Dark red to bluish, less than ½" in diameter.
Stem-Many, but thicker and less numerous than in V. scoparium, strongly angled.
Forage Value-Fair for elk, deer, and goats; fruit valuable for birds.
Similar species-V. scoparium.

Vaccinium scoparium- grouse whortleberry
Habit-Low shrub, 4-10" tall.
Leaves-Alternate, deciduous, oval-shaped, fine toothed, less than ½" long.
Flowers-Pinkish, bell-shaped.
Fruit-Bright red, less than ¼" in diameter.
Stem-Broomlike, young stems strongly angled, bright green to yellowish green.
Forage value-Fair for elk, deer, and goats. Fruit valuable for birds.
Similar species-V. myrtillus-Similar but with less numerous branches and brooming and a darker red to bluish berry. Treated as an ecological equivalent.



Vaccinium scoparium

PERENNIAL GRAMINOIDS



Agropyron spicatum - bluebunch wheatgrass

Habit - perennial bunchgrass, rarely with rhizomes.

Inflorescence - solitary erect spike, 2 to 6 inches long, spikelets not crowded, lemma tipped by a spreading awn or beard about 1" long.

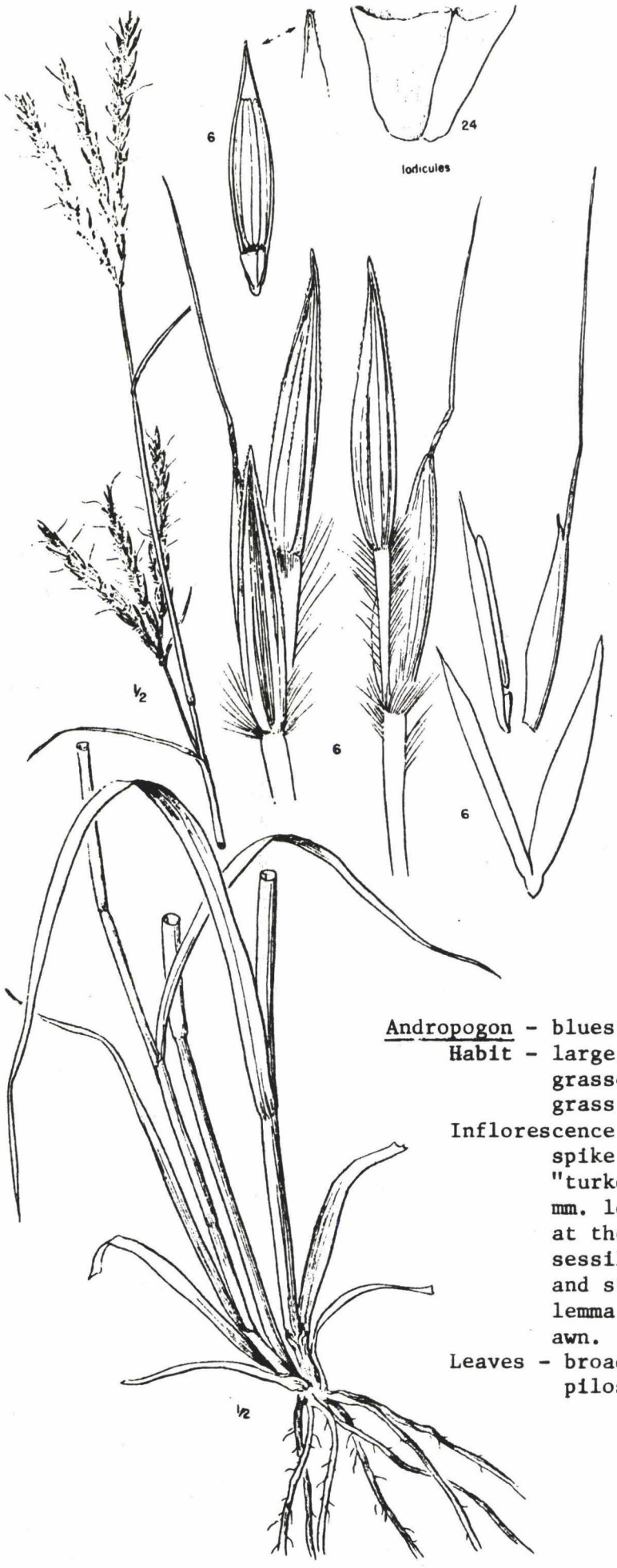
Culms - erect, round, 18 - 40" tall, with a powdery bluish bloom.

Leaves - erect, flat or inrolled, pointed, about 1/8" wide and 2 - 8" long.

Auricles - may or may not be present.

Ligules - membranous, very short.

Forage value - high for elk and all livestock.



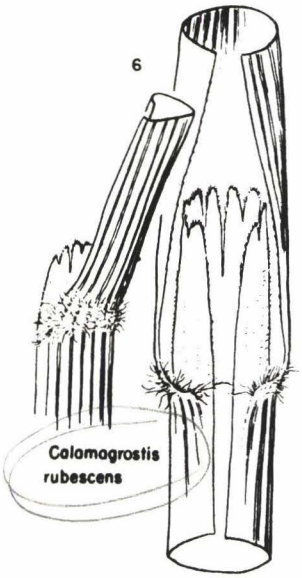
Andropogon - bluestem

Habit - large, tufted perennial bunchgrasses of the tall- and midgrass prairies and woodlands.

Inflorescence - appearing as a branched spike (actually semi-racemose) or "turkey foot;" spikelets 7 to 10 mm. long, hairy, borne in pairs at the nodes, the fertile one sessile, the other pedicellate and sterile or staminate; fertile lemma with a twisted geniculate awn.

Leaves - broad, flat or folded; often pilose near the ligule.

Andropogon gerardii

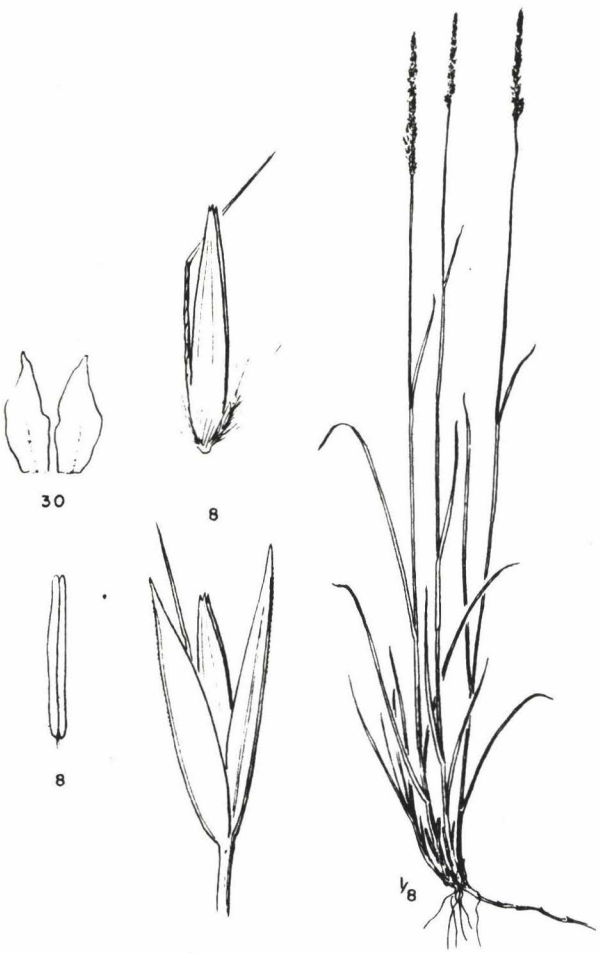


Calamagrostis canadensis - bluejoint

Vegetative - leaf collar glabrous (or essentially so); basal leaf sheaths stout, tan to straw colored.

Floral - awn of lemma straight; callus hairs about as long as the floret (see illustration).

Site - moist, poorly drained.



Calamagrostis rubescens

C. canadensis

Calamagrostis rubescens - pinegrass

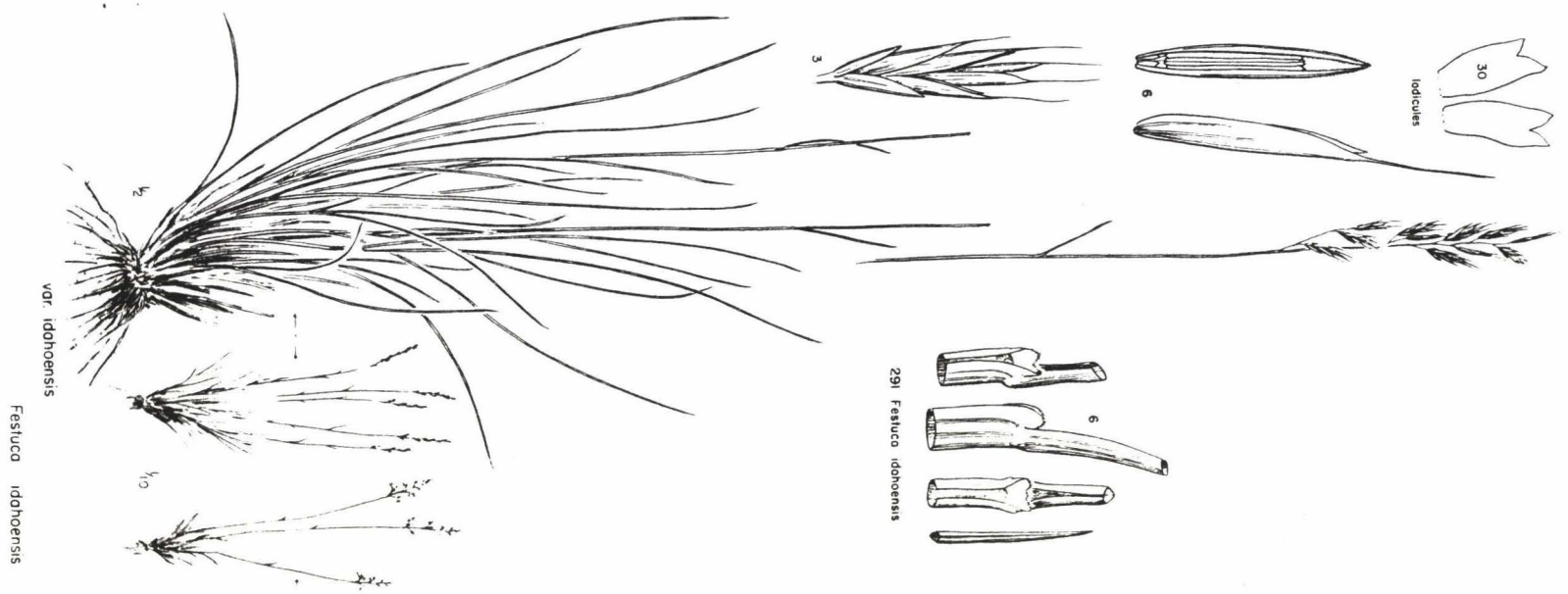
Vegetative - leaf collar with conspicuous tufts of hairs; basal sheaths slender, purplish colored; upper surface of blade shining bright green.

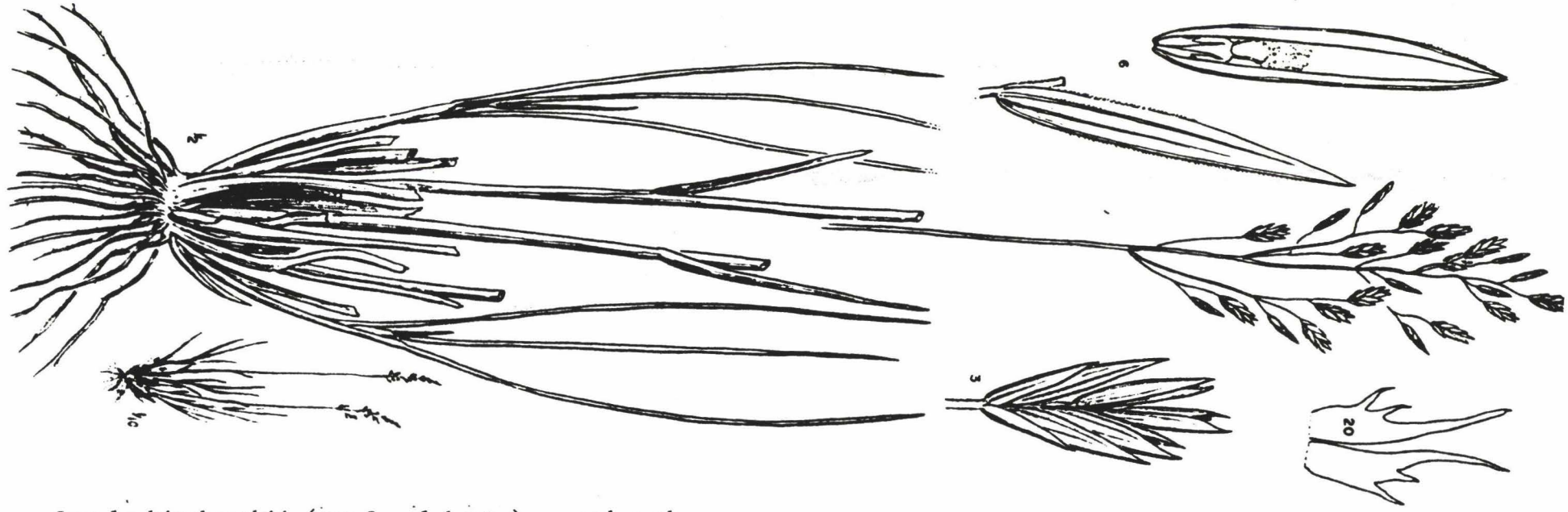
Floral - awn of lemma bent; callus hairs less than 3/4 length of floret.

Site - upland well drained sites.

Carex geyeri - elk sedge
Habit - perennial grasslike plant with rhizomes.
Inflorescence - male spike terminal and solitary, female spikes 1 - 3, stigmas usually 3.
Culms - triangular, solid, 6 - 20" tall.
Leaves - 3 ranked, about 1/8" wide.
Forage value - fair to good.

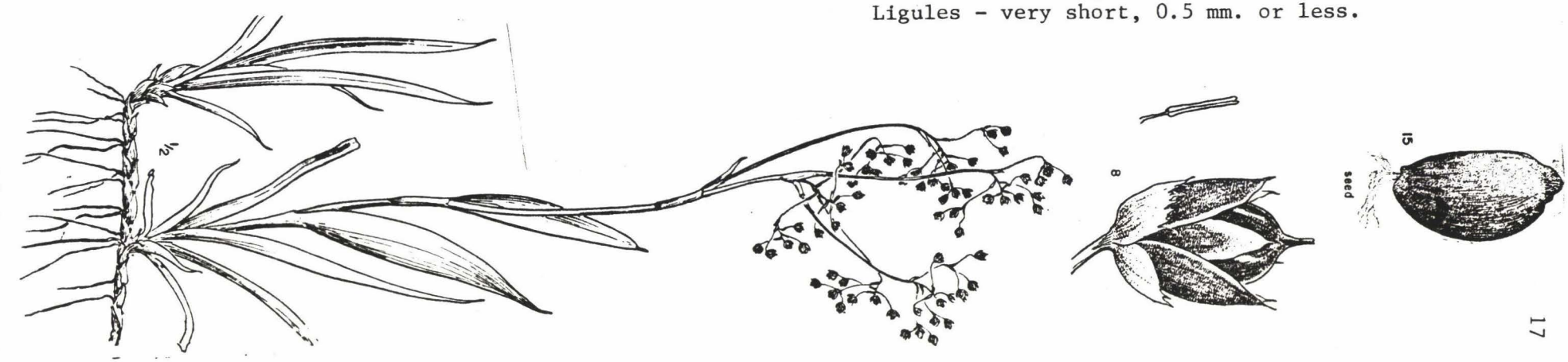
Festuca idahoensis - Idaho fescue
Habit - perennial bunchgrass, nonrhizomatous.
Inflorescence - erect, narrow to open panicle, 4 - 8" long. Spikelets with short awns.
Culms - erect, 12 - 36" tall, sometimes reddish.
Leaves - erect, narrow, green to bluish green.
Auricles - lacking.
Ligules - usually absent.
Forage value - fair to good.



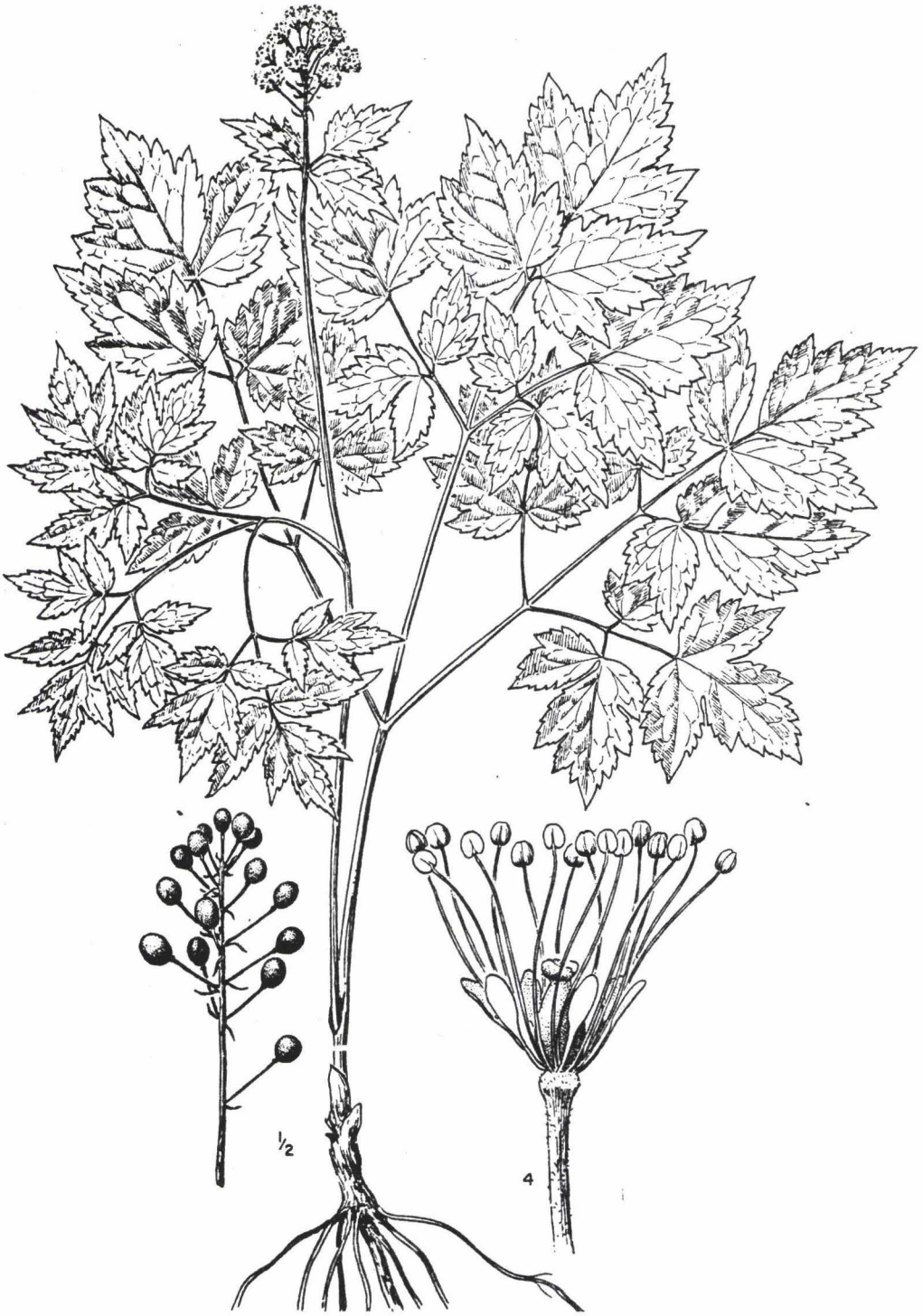


Luzula hitchcockii (was L. glabrata) - wood rush
Habit - perennial, rhizomatous grass-like plant up to 1-1/2 feet tall.
Leaves - shiny to glossy, bright green with tips often reddish brown flattened.
Flowers - small, inconspicuous, rush-like in flat topped clusters above the leaves.
Similar species - L. parviflora - dull green foliage and flowers drooping.

Festuca scabrella - rough fescue
Habit - large, robust, bunchgrass; flowering stems and heads 2 to 3½' tall.
Inflorescence - semiopen panicle, lemma pointed but not awned.
Culms - erect, showing no nodes (key character).
Leaves - usually tightly rolled to appear round rather than flat.
Auricles - lacking.
Ligules - very short, 0.5 mm. or less.



PERENNIAL FORBS AND FERNS



Actaea rubra

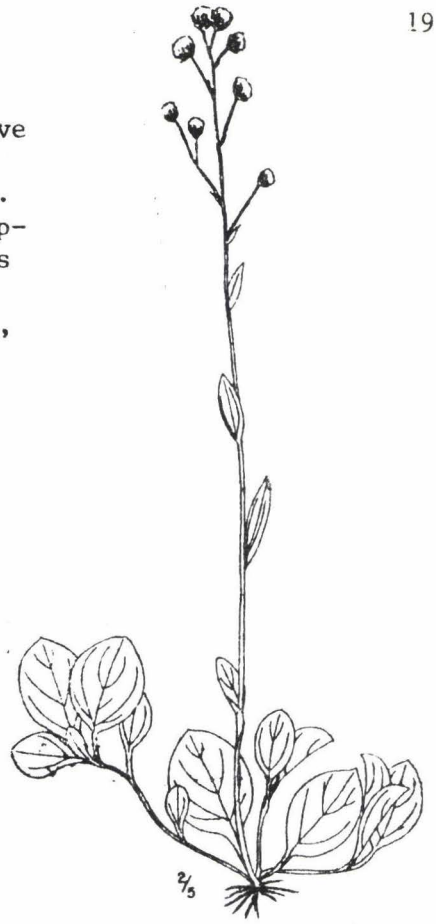
Actaea rubra-baneberry
Habit-Perennial forb,1-2' tall,inhabiting moist sites at middle elevations in the forest zone.
Leaves-2-3 times ternate, sharply toothed or lobed.
Flowers-White clusters.
Fruit-Showy red (occasionally white) berries.

Antennaria racemosa - Woods pussytoes

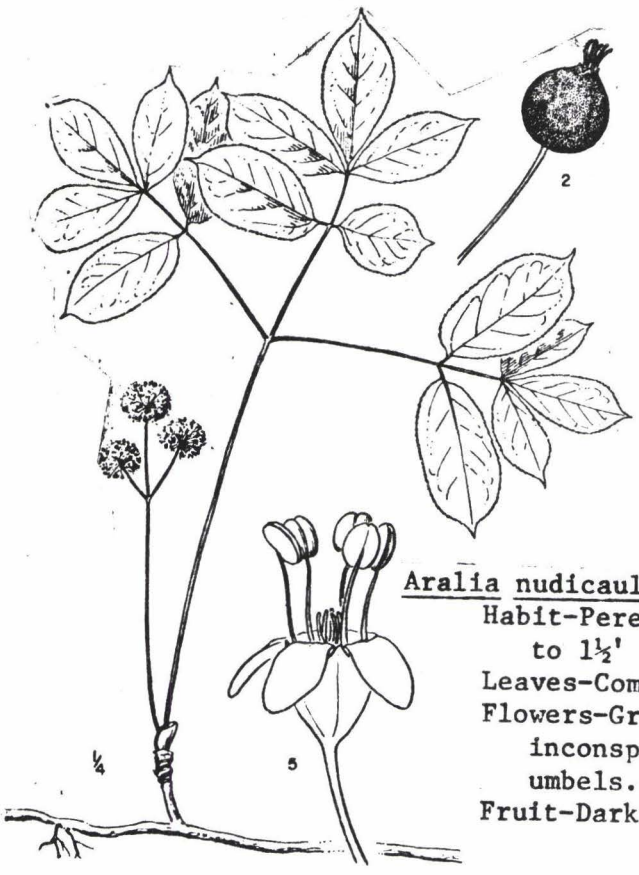
Habit - perennial forb, of forests, vegetative stems prostrate forming small mats; flowering stems erect, 4 to 24" tall.

Leaves - basal leaves short, petiolate, elliptical, green upper surface contrasts with white, hairy lower surface.

Heads - several to many arranged as a raceme, unlike other Antennarias which have more compact inflorescences.



A. racemosa



Aralia nudicaulis

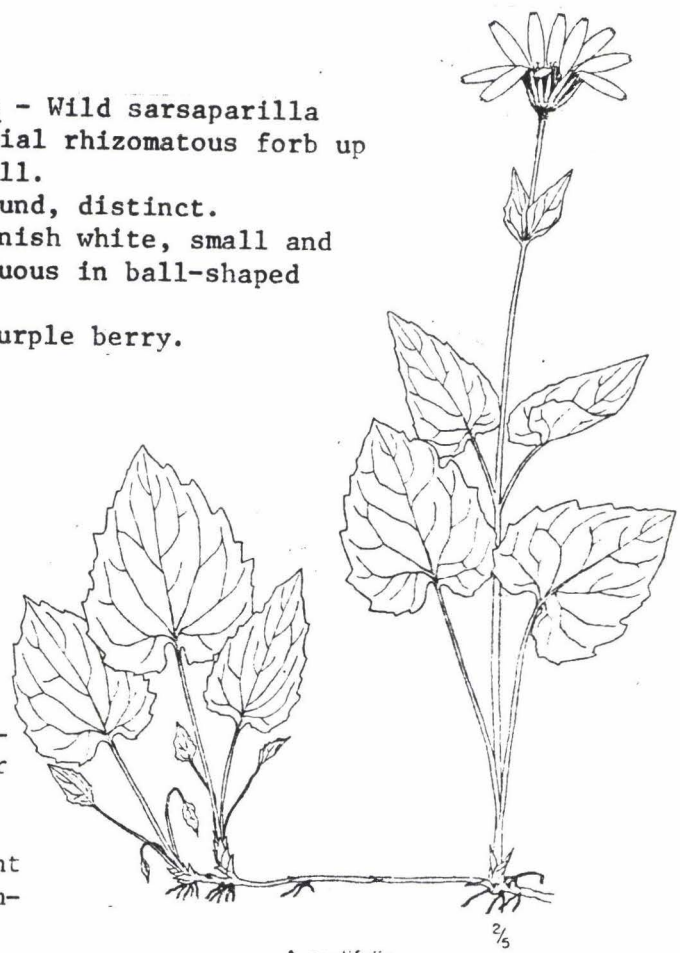
Aralia nudicaulis - Wild sarsaparilla

Habit-Perennial rhizomatous forb up to 1½' tall.

Leaves-Compound, distinct.

Flowers-Greenish white, small and inconspicuous in ball-shaped umbels.

Fruit-Dark purple berry.



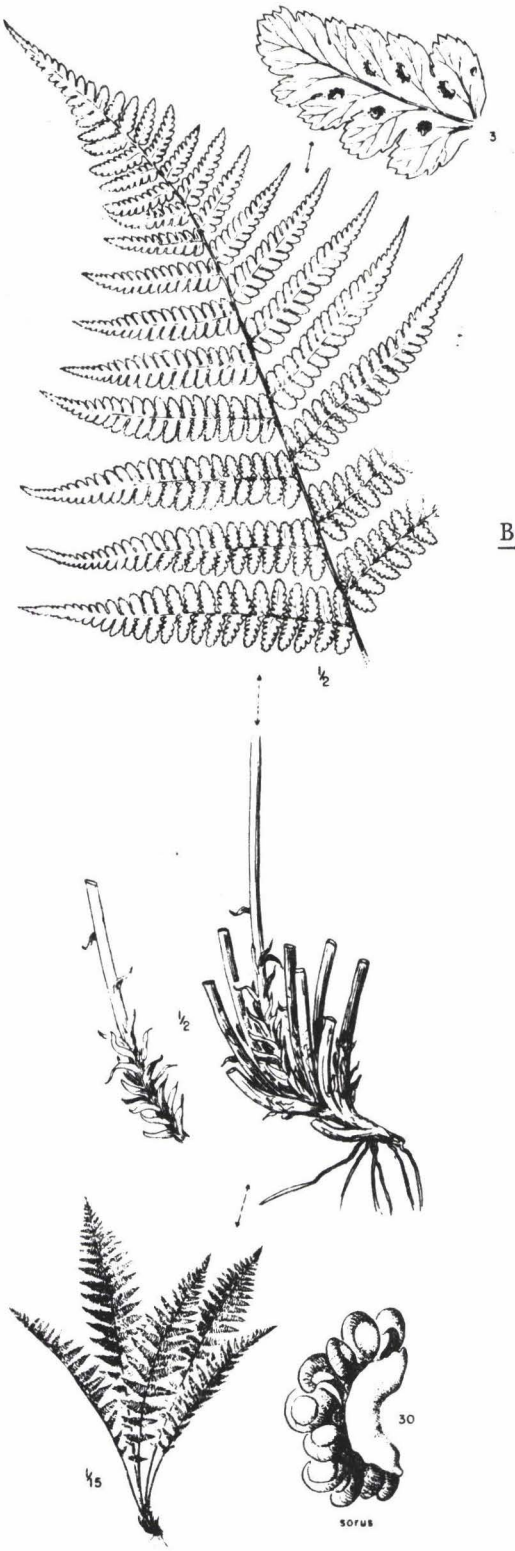
A. cordifolia

Arnica cordifolia - arnica

Habit - perennial forb, a major understory plant of the Douglas-fir forests.

Leaves - broad, heart-shaped, often white-hairy and with prominent veins, borne opposite on prominent stem.

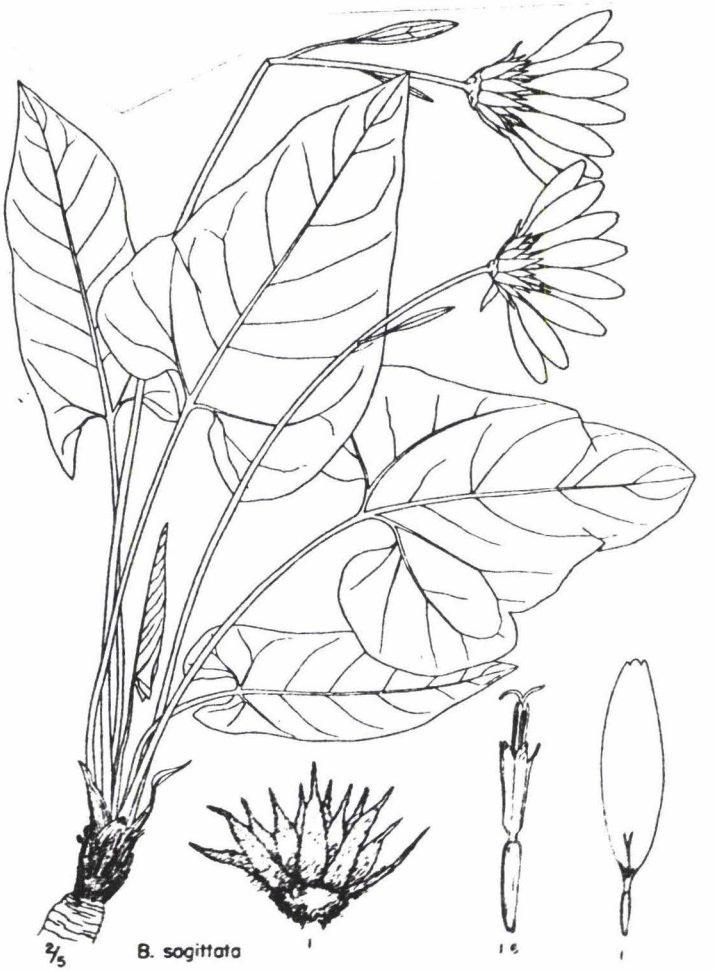
Flowers - large, showy and yellow.

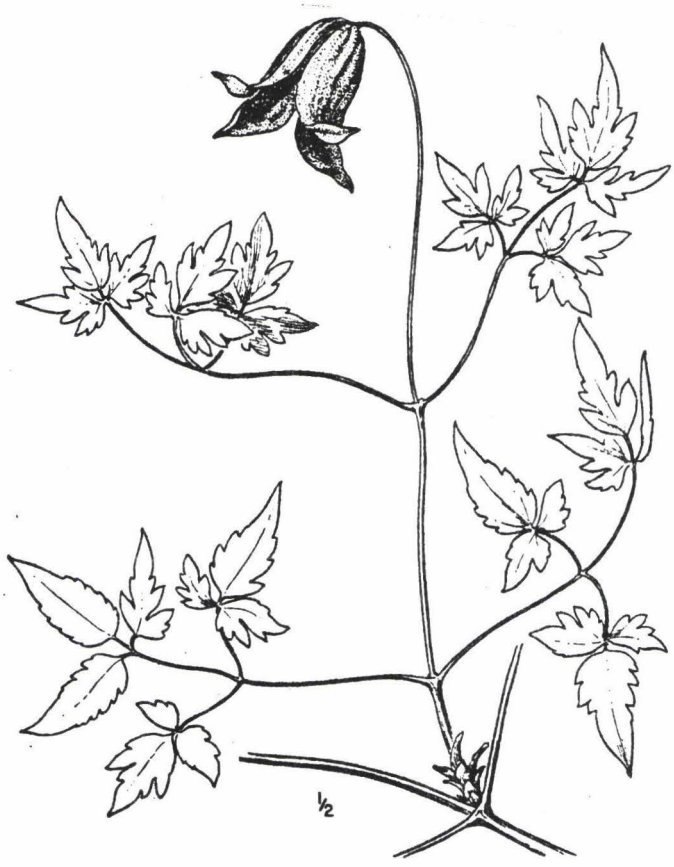


Athyrium filix-femina

Athyrium filix-femina - lady fern
Habit - perennial fern.
Leaves - 1 to 5 feet long in vase-like clusters, leaf stalk flat to grooved.

Balsamorhiza sagittata - arrowleaf balsamroot
Habit - perennial, very stout taproot forb up to 1½ feet tall.
Leaves - large arrowhead shaped from a basal cluster.
Flowers - yellow-orange, sunflower-like flower stalks from basal clump.





C. pseudoalpina

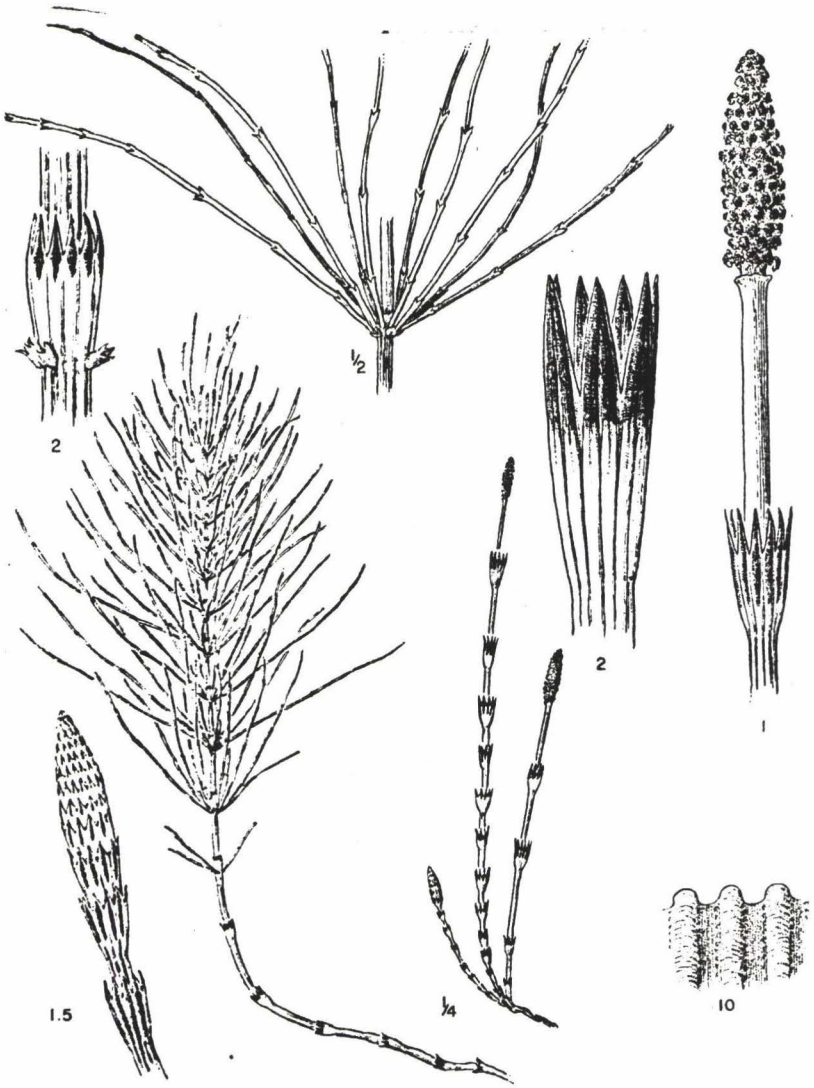
Clematis tenuiloba

Clematis pseudoalpina - Virgin's bower
Habit - vining perennials.
Flowers - showy, single, with 4 bluish "petals" (sepals).
Leaves - twice ternate, secondary divisions coarsely toothed or lobed.

Clematis tenuiloba
Habit - forming small mats, but not vining, perennial.
Flowers - showy, single, with 4 bluish "petals."
Leaves - three times ternate.

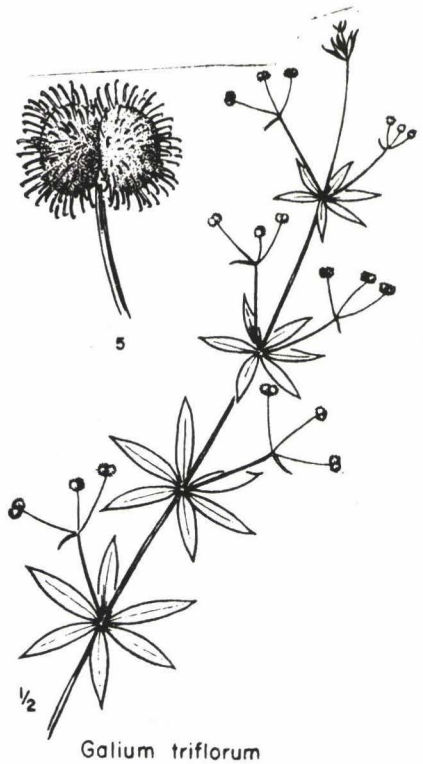
Clintonia uniflora

Clintonia uniflora - queencup beadlily
Habit - perennial forb, rhizomatous, 2 - 8" tall.
Leaves - 2 to 3, smooth above, hairy below, 4 - 7" long.
Flowers - white, single, parts in 3's (6's), 1" across.
Fruit - smooth blue berry.
Similar species - Erythronium grandiflorum--leaves not hairy, yellow.



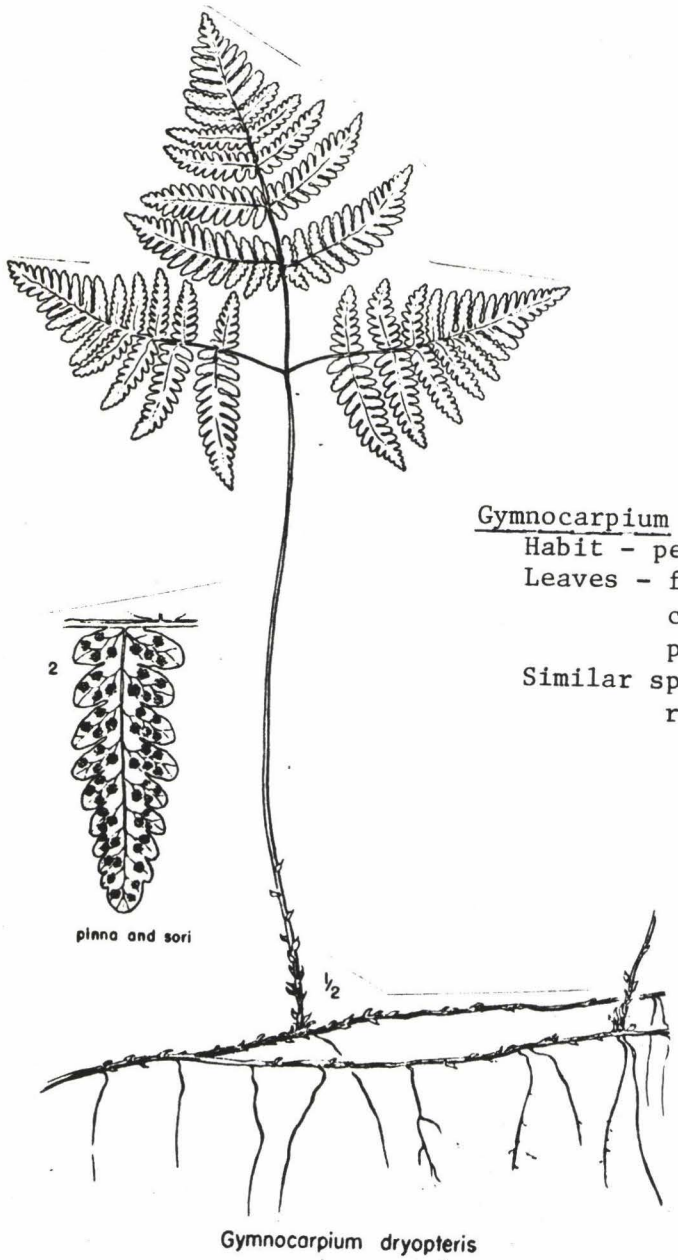
Equisetum arvense

Equisetum arvense - field horsetail
Habit - a common and distinctive plant of marshy areas and streamsides.
Stems - sterile (vegetative) stems common, 1 - 1½ feet tall, bearing whorls of slender rod-like leaf branches. Fertile stems uncommon, simple, white to brownish and soon withering.



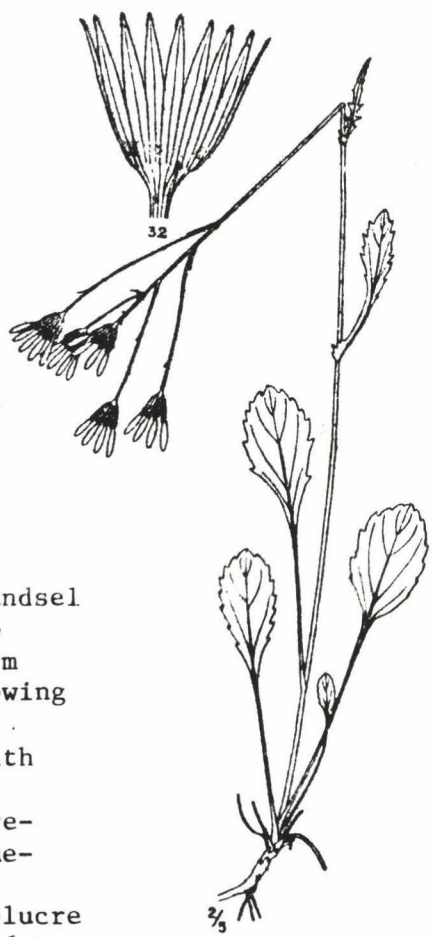
Galium triflorum

Galium triflorum - sweetscented bedstraw
Habit - perennial forb, rhizomatous.
Leaves - mostly 6 in a whorl, vanilla-scented, 1-nerved.
Flwoers - white, usually in groups of 3.
Fruit - covered with hooked bristles.
Stem - square, hooks on the angels, ½ - 2 feet long, frequently lying on the ground.
Similar species - G. aparine - annual, tap-rooted.



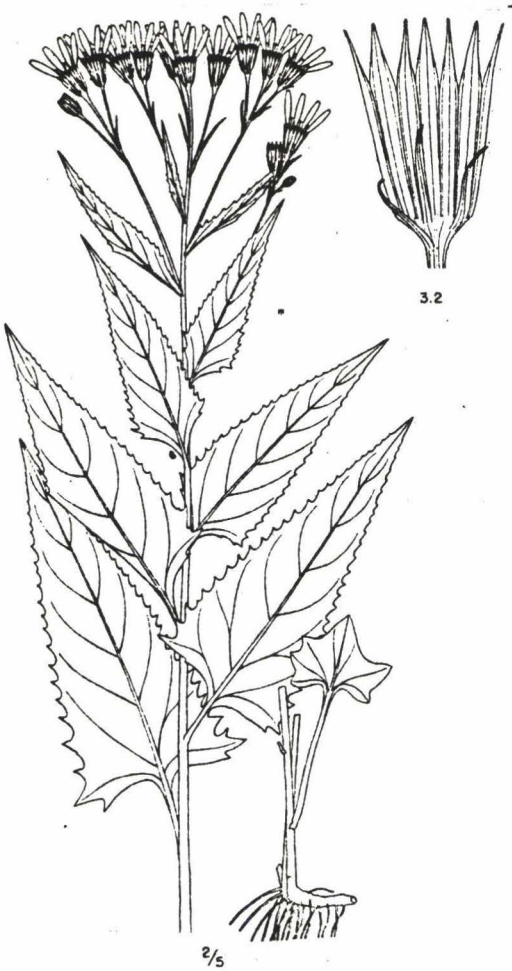
Gymnocarpium dryopteris

Gymnocarpium dryopteris - Oak fern
Habit - perennial, rhizomatose fern up to 8".
Leaves - fronds doubly compound, appear to be composed of 3 compound leaflets that parallel the ground surface.
Similar species - a very distinct fern, not readily confused with other ferns.



S. ~~cymbolorioides~~
S. streptanth. folius

Senecio streptanthifolius - cleft leaf groundsel
Habit - small, solitary perennial forb with fibrous roots arising from a caudex or short rhizome; growing mostly in semi-arid forests.
Leaves - basal ones rosette-forming with blue-green, coarsely toothed blades; stem leaves few and reduced; bluish, thick, and somewhat succulent.
Flower - flowering heads several; involucre 5 to 7 mm. high; rays yello, 6 to 12 mm. long.

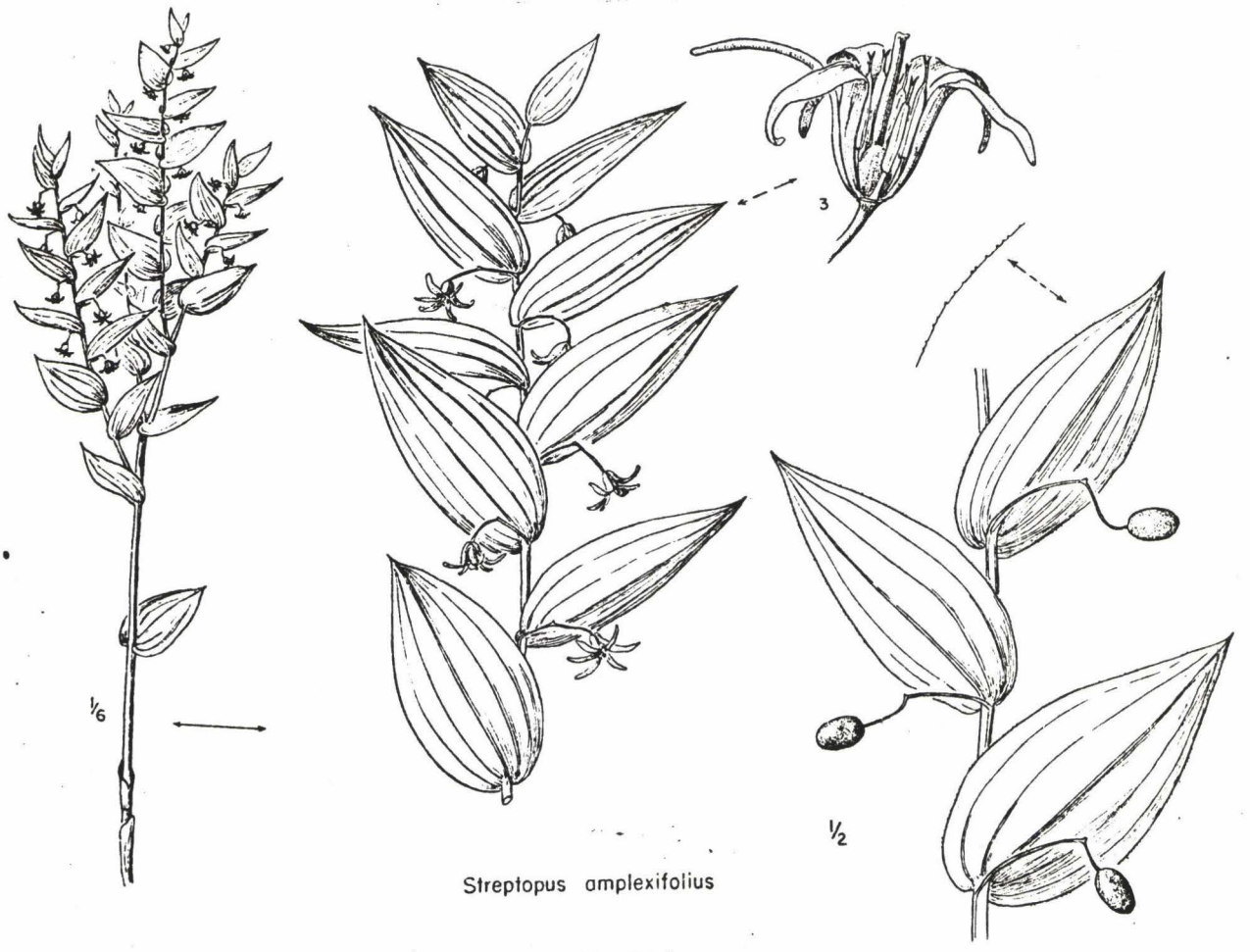


S. triangularis

Senecio triangularis - arrowleaf groundsel
Habit - tall perennial forb with leafy stems, growing in wet meadows and streamsides.
Leaves - distinctly triangular, 3 - 6" long, gradually reduced upwards.
Flowers - yellow composite.

Smilacina stellata

Smilacina stellata - Starry Solomon's seal
Habit - rhizomatous perennial 8 - 10" tall, erect or leaning; widespread in forested areas.
Leaves - sessile, parallel veined, lanceolate - elliptic, with a long-pointed tip; 2 - 5" long; with a more or less clasping base.
Flowers - white, lily-like, petals obvious, 5 - 10 in a raceme.
Fruit - berry 7 - 10 mm. long, greenish-yellow, becoming blackish.
Similar species - Smilacina racemosa, inflorescence a panicle, plant is more robust, with leaves broader in proportion to their length. Both species have green unbranched stems (cf. Disporum or Streptopus).



Streptopus amplexifolius

Streptopus amplexifolius - twisted stalk
Habit - rhizomatous perennial forb growing in wet sites.
Flowers - white, but tinged with green; borne one beneath each leaf.
Fruit - bright orange berry.

Thalictrum occidentale - Western meadowrue

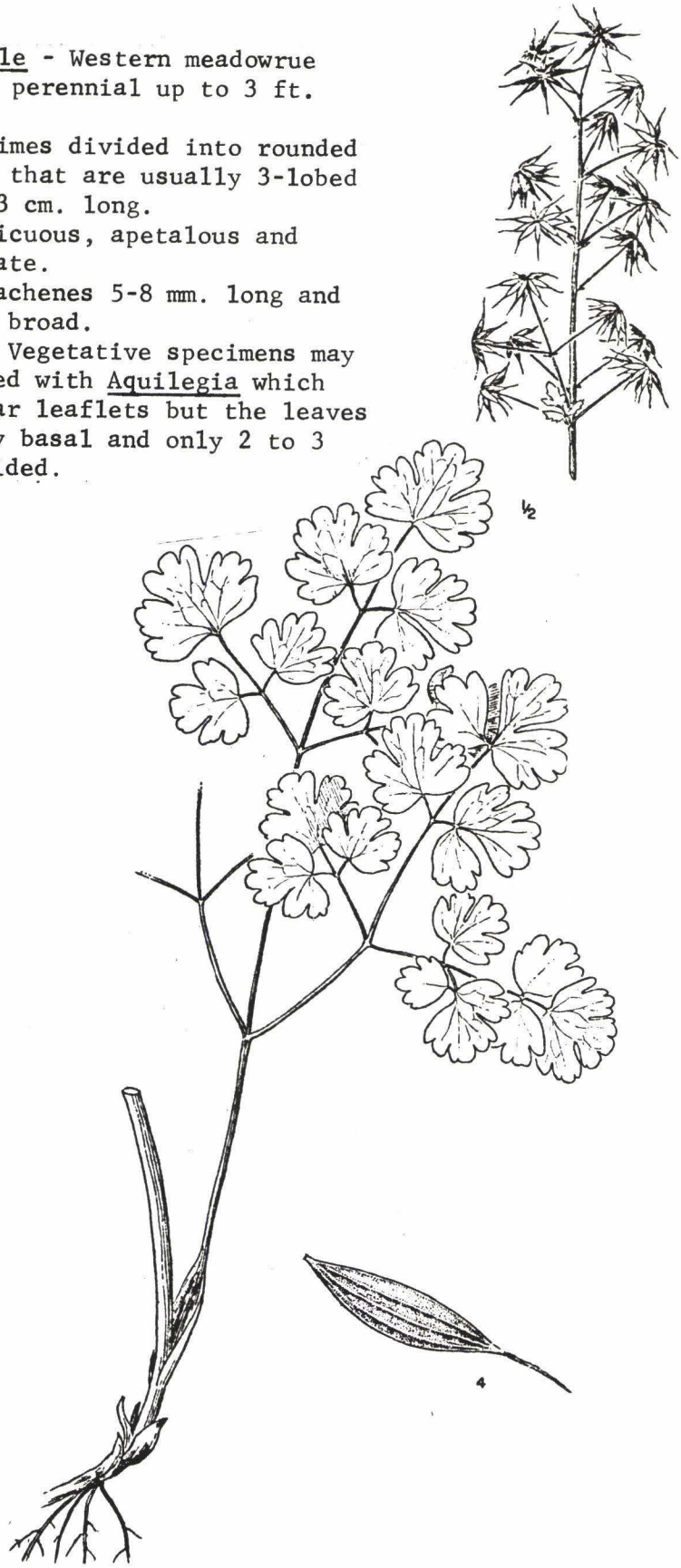
Habit - dioecious perennial up to 3 ft. tall.

Leaves - 3 to 4 times divided into rounded leaflets that are usually 3-lobed and 1.5-3 cm. long.

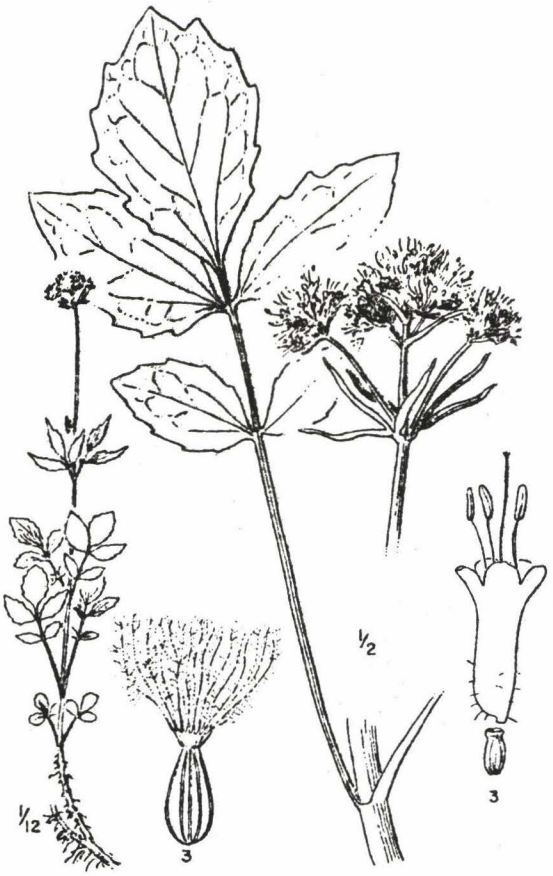
Flowers - Inconspicuous, apetalous and paniculate.

Fruit - Elliptic achenes 5-8 mm. long and 2-2.5 mm. broad.

Similar species - Vegetative specimens may be confused with Aquilegia which has similar leaflets but the leaves are mostly basal and only 2 to 3 times divided.

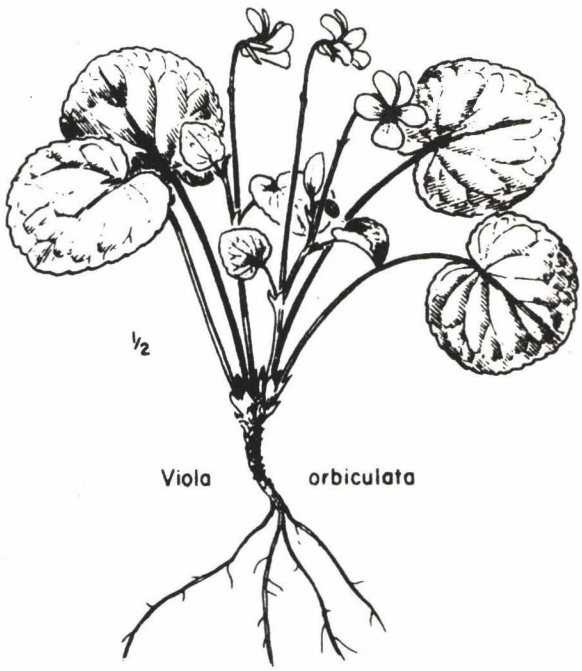


T. occidentale

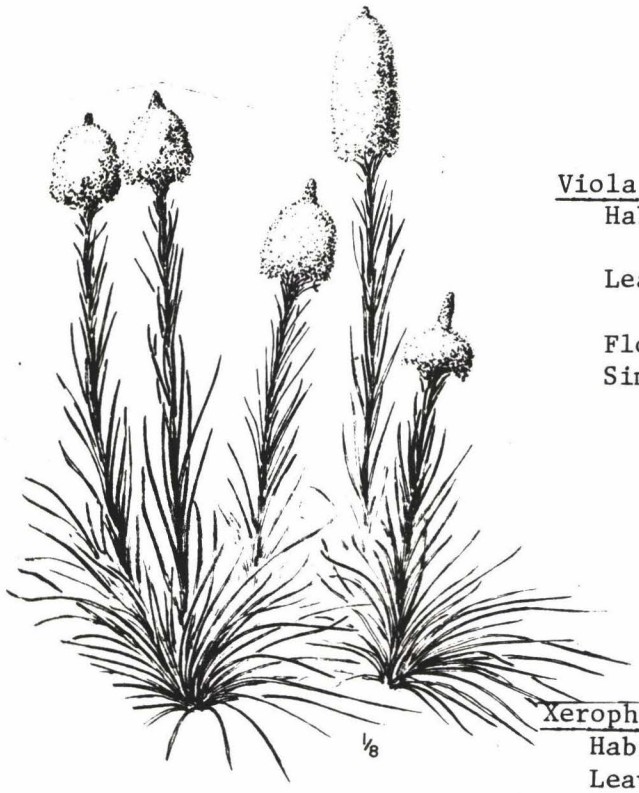


Valeriana sitchensis

Valeriana sitchensis - Sitka valerian
Habit - fibrous-rooted perennial from a stout, branched rhizome.
Leaves - chiefly cauline, 2 - 5 pairs; the lower-most one or two pairs reduced.
Flowers - white in a terminal cluster.



Viola orbiculata - western round-leaved violet
Habit - perennial forb, rhizomatous, 2 - 4" tall.
Leaves - round to heart-shaped, often over-wintering.
Flowers - yellow.
Similar species - V. glabella - leaves usually pointed.



Xerophyllum tenax

Xerophyllum tenax - beargrass
Habit - perennial forb.
Leaves - grass-like in dense clumps, evergreen.
Flowers - white in clusters, flowering stems up to 5 feet tall.